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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,684	06/26/2003	Mahmoud H. Abd Elhamid	GP-302186	3780

7590

05/30/2006

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EXAMINER

CANTELMO, GREGG

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 05/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/603,684

Applicant(s)

ABD ELHAMID ET AL.

Examiner

Gregg Cantelmo

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-22 and 24-47 is/are pending in the application.
- 4a) Of the above claim(s) 34-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-22 and 24-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In response to the amendment received May 18, 2006:
 - a. Claims 1-4, 6-22, 24-47 are pending with claims 34-47 withdrawn from consideration as to a non-elected invention;
 - b. Upon further consideration, the prior art rejections to Maeno stand as explained herein.

Withdrawal of Allowable Subject Matter

2. Upon further consideration, the limitations of claims 5 and 23 were not given their broadest reasonable interpretation in the previous office action. These claims were thought to show the arrangement as shown in example in Fig. 1. Therein some of the expanded graphite particles extend across the plate and further extend beyond the plate thickness. However, claims 5 and 23 do not in fact limit to this arrangement. Rather the previously indicated allowable subject matter only requires that the particles have a size which is greater than 10% of the thickness of the plate. So according to this limitation, if the plate is 10mm, then the particle sizes only need to be greater than 1mm. Upon reevaluation of this claimed limitation, it is apparent that Maeno still anticipates this relationship.

In light of this, a second action, which is non-final is presented herein.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 1745

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4, 7-11, 13, 16-18, 21, 22, 25-27, 29 and 32-33 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,971,726 (Maeno).

Maeno discloses a sheet comprising a mixture of polypropylene and expanded graphite (Experiments 3-5 as applied to claim 1). The particles have a diameter of 0.5 mm and a plate thickness of 2mm for each experiment under Example 1 (col. 4, ll. 45-50). The final plate thickness is 2 mm and the particles, at 0.5 mm, constitute particle sizes which are 25% of the final plate thickness and thus greater than 10 percent of the final plate thickness (as applied to claim 1).

In Experiment 3, the expanded graphite average particle size is 0.5 mm (as applied to claim 4).

The polymeric material is polypropylene (Examples 1-16 as applied to claims 7 and 8).

The expanded graphite has an inherent degree of compression relative to the amount of force exerted on the sheet. Note that the claims fail to specify any value or range of values for the extent of the compression and thus can be any degree of compression (as applied to claim 9).

In addition, the voids where the resin is present is construed to be equivalent to the pores present in the graphite material (as applied to claim 10). Note that the end product is not porous else it would not effectively function as a separator.

In Examples 1-9 and 13, carbon black is added to the mixture and broadly exemplifies a filler (as applied to claim 11).

Maeno discloses a sheet comprising a mixture of polypropylene and expanded graphite (Experiments 1-10 and 13-15 as applied to claim 18).

The compressible material is expanded graphite, as discussed above (applied to claim 21).

In Experiment 3, the expanded graphite average particle size is 0.5 mm (as applied to claim 22).

The polymeric material is polypropylene (Examples 1-16 as applied to claims 25 and 26).

In Examples 1-9 and 13, carbon black is added to the mixture and broadly exemplifies a filler (as applied to claim 27).

Considering that Maeno teaches of using the same expanded graphite in the same resin and both are used as a conductive sheet, there is a reasonable expectation that composite separators of Maeno would inherently exhibit the same claimed permeation and specific resistance requirements, absent clear evidence to the contrary.

Response to Arguments

4. Applicant's statements with respect to the claims and previously identified allowable subject matter (since withdrawn) have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 2, 3, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeno in view of U.S. Patent Application Publication No. 2002/0182473 (Blunk)

Art Unit: 1745

The teachings of Maeno have been discussed above and are incorporated herein.

The difference not yet discussed is of the volume percent of the expanded graphite (claims 2 and 3) or compressible material (claims 19 and 20).

Blunk discloses providing a composite separator wherein the conductive graphite material is present in an amount which is less than 50 vol.% (paragraph 25 on page 2).

The motivation for decreasing the volume of the conductive graphite and increasing the volume of the resin is to improve the mechanical properties of the separator while maintaining excellent electrical conductivity.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Maeno by decreasing the volume of the conductive graphite and increasing the volume of the resin since it would have improved the mechanical properties of the separator while maintained excellent electrical conductivity.

6. ~~Claims 14-15 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeno in view of U.S. Patent No. 6,811,918 (Blunk).~~

The teachings of Maeno have been discussed above and are incorporated herein.

The differences between claims 14-15 and 30-31 and Maeno does not teach of the conductive layer disposed over the separator (claims 14 and 30) or of the conductive layer material being selected from the group consisting of gold, silver, platinum, carbon, palladium, rhodium and ruthenium.

Blunk discloses a composite bipolar separator where metal films are disposed on the outer surfaces of the separator. The surface is coated with materials including gold, ruthenium, palladium, rhodium and platinum (col. 9, ll. 35-45).

The motivation for providing a metal film on the outer surface of the composite separator is to reduce the contact resistance of the components

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Maeno by providing a metal film on the outer surface of the composite separator since it would have reduced the contact resistance of the components.

7. Claims 6 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeno in view of U.S. Patent No. 6,811,918 (Blunk).

The teachings of Maeno have been discussed above and are incorporated herein, independent of one another.

The difference between claims 6 and 24 and Maeno is that Maeno does not teach of the graphite extending across the separator plate.

Blunk discloses a composite bipolar separator where the graphite bridges 115 extends through the separator plate 110 (col. 9, ll. 35-45).

This serves to conduct current flow through the composite.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Maeno or by providing graphite to extend across the separator since it would have provided electrical flow paths through the composite material.

Art Unit: 1745

8. Claims 12 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeno.

The teachings of Maeno have been discussed above and are incorporated herein, independent of one another.

The difference between claims 12 and 28 and Maeno is that Maeno does not teach of the particular filler of claims 12 and 28.

Maeno does disclose that the prior art recognized that other fillers, such as metal fillers in the art (col. 1).

The motivation for adding metal fillers is to increase the electrical conductivity of the sheet.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Maeno by adding at least a minute amount of metal filler to the sheet since it would have increased the electrical conductivity of the composite sheet. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

Response to Arguments

9. Applicant's statements with respect to the claims and previously identified allowable subject matter (since withdrawn) have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



gc
May 24, 2006

Gregg Cantelmo
Primary Examiner
Art Unit 1745